Deployment Guide

Citrix NetScaler for Microsoft Lync
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Introduction

Citrix® NetScaler® optimizes the delivery of Web applications—increasing security, improving performance, and expanding Web server capacity. This approach ensures the best total cost of ownership (TCO), security, availability, and performance for Web applications. The Citrix NetScaler solution is a comprehensive network system that combines high-speed load balancing and content switching with state-of-the-art application acceleration, layer 4-7 traffic management, data compression, dynamic content caching, SSL acceleration, network optimization, and robust application security to provide a single, tightly integrated solution. Deployed in front of application servers, the NetScaler significantly reduces processing overhead on application and database servers, resulting in reduced hardware and bandwidth costs.

There are several ways to configure the NetScaler to load balance the Microsoft Lync servers. NetScalers can be configured through their GUI configuration utility or through the CLI. This guide describes both scenarios, using the Lync Server 2010 as an example. Microsoft Lync 2010 has Standard and Enterprise Editions available. However, the Enterprise Edition is the one that requires a hardware load balancer at the front end of a large deployment with multiple servers in order to scale to the maximum number of users for the Enterprise customers. For large-scale deployments,

NetScaler will front end the Lync servers with Virtual IP addresses and balance the load across the Lync server pool. After Lync clients register on an active directory or Enterprise pool, the client traffic is bound to an Lync-specific server through the NetScaler. Each Lync server within the Enterprise pool directory handles the server applications, security, authentication, and connection and protocol processing. The SQL database in the back end handles the persistent data, such as contact lists and Access Control Lists. Therefore, the same client can be processed by any Lync server in the pool at any given time.
Solution Requirements

• Load Balanced Microsoft Lync server environment

Prerequisites

• NetScaler v9.2+ (Quantity 2 for High Availability)
• Microsoft Lync Server 2010
Network Diagram

The following is the Network that was used to develop this deployment guide.

Citrix
NetScaler for
Microsoft Lync
Logical Diagram

Network Diagram

<table>
<thead>
<tr>
<th>Lync Server</th>
<th>IPAddress</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>edgeap1</td>
<td>172.29.107.101</td>
<td>443,135</td>
</tr>
<tr>
<td>edgedp1</td>
<td>172.29.107.103</td>
<td>443</td>
</tr>
<tr>
<td>edgemr1</td>
<td>172.29.107.104</td>
<td>443,3478</td>
</tr>
</tbody>
</table>

Lync Access Edge

<table>
<thead>
<tr>
<th>Lync Server</th>
<th>IPAddress</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE1</td>
<td>10.6.66.30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80,135,443,444,5060,5061</td>
<td></td>
</tr>
</tbody>
</table>

Lync Front-End 1

<table>
<thead>
<tr>
<th>Lync Server</th>
<th>IPAddress</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE2</td>
<td>10.6.66.31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80,135,443,444,5060,5061</td>
<td></td>
</tr>
</tbody>
</table>

Lync Front-End 2

<table>
<thead>
<tr>
<th>Lync Server</th>
<th>IPAddress</th>
<th>Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSrv_Lync</td>
<td>10.6.66.35</td>
<td>80,135,443,444,5060,5061</td>
</tr>
</tbody>
</table>

Database

VIP

edgeap 172.29.107.214 443,135
edgedp 172.29.107.217 443
edgemr 172.29.107.218 443,3478

Lync A/V

VIP

edgeap2 172.29.107.105 443,135
edgedp2 172.29.107.109 443
edgemr2 172.29.107.110 443,3478

NetScaler

VIP

edgeap 172.29.107.214 443,135
edgedp 172.29.107.217 443
edgemr 172.29.107.218 443,3478

NetScaler

IP Address Ports

10.6.66.35 80,135,443,444,5060,5061

Internal VLAN 66

External VLAN 305
Citrix
NetScaler for
Microsoft Lync
Physical Diagram

NetScaler
edgeap: 172.29.107.214
edgedp: 172.29.107.217
edgemr: 172.29.107.218
svr_Lync: 10.6.66.35

Lync Front-End 1
FE1: 10.6.66.30

Lync Access Edge
edgeap1: 172.29.107.101
edgedp1: 172.29.107.103
edgemr1: 172.29.107.104

Lync Front-End 2
FE2: 10.6.66.31

VLAN 305

VLAN 66

Database

Lync A/V
edgeap2: 172.29.107.105
edgedp2: 172.29.107.109
edgemr2: 172.29.107.110
Networking
Add Subnet IPs

Create a certificate request on the NetScaler, and we will submit it to the Windows Certificate Authority to issue a certificate.

Connect to NetScaler:
Network -> IPs.
Add.

In this example we are adding two Subnet IP addresses. The 172 address will be bound to VLAN 1, while the 10 address will be bound to VLAN 66.

Subnet IPs are used as the Source IP Address when routing packets that leave the NetScaler.
Using the Command Line Interface:

At the NetScaler command prompt, type:

```
set ns hostName nslync
add ns ip 63.110.51.88 255.255.255.0 -vServer DISABLED
add ns ip 172.29.107.215 255.255.252.0 -vServer DISABLED
add ns ip 10.6.66.250 255.255.255.0 -vServer DISABLED
add vlan 66
bind vlan 66 -IPAddress 10.6.66.250 255.255.255.0
```

Add VLANs:

Navigate to Network -> VLANs.

Add VLAN 66.

We will bind the Subnet IP Address 10.6.66.250 to VLAN 66. This is equivalent to a VLAN IP Address, but is also used as the Source IP for routing packets from the NetScaler.
Add Monitors:
These are the monitors that will determine the uptime of the Microsoft Lync Servers.
In the NetScaler GUI, navigate to Load Balancing -> Monitors -> Add.
For this example:

<table>
<thead>
<tr>
<th>Monitor</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>MON_80</td>
<td>TCP 80</td>
</tr>
<tr>
<td>MON_443</td>
<td>TCP 443</td>
</tr>
<tr>
<td>MON_5060</td>
<td>TCP 5060</td>
</tr>
<tr>
<td>MON_5061</td>
<td>TCP 5061</td>
</tr>
</tbody>
</table>

Using the Command Line Interface:
At the NetScaler command prompt, type:

- `add lb monitor MON_5061 TCP -LRTM ENABLED -destPort 5061 -secure YES`
- `add lb monitor MON_5060 TCP -LRTM ENABLED -destPort 5060`
- `add lb monitor MON_80 TCP -LRTM ENABLED -destPort 80`
- `add lb monitor MON_443 TCP -LRTM ENABLED -destPort 443`
- `save config`
Add Lync Servers to be Load Balanced

Add Servers:
These are the Microsoft Lync Servers that the NetScaler will Load Balance.
In the NetScaler GUI, navigate to Load Balancing -> Servers -> Add.
For this example:

<table>
<thead>
<tr>
<th>Server</th>
<th>IP Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE1</td>
<td>10.6.6.30</td>
</tr>
<tr>
<td>FE2</td>
<td>10.6.66.31</td>
</tr>
<tr>
<td>edgeap1</td>
<td>172.29.107.101</td>
</tr>
<tr>
<td>edgedp1</td>
<td>172.29.107.103</td>
</tr>
<tr>
<td>edgemr1</td>
<td>172.29.107.104</td>
</tr>
<tr>
<td>edgeap2</td>
<td>172.29.107.105</td>
</tr>
<tr>
<td>edgedp2</td>
<td>172.29.107.109</td>
</tr>
<tr>
<td>edgemr2</td>
<td>172.29.107.110</td>
</tr>
</tbody>
</table>

Using the Command Line Interface:
At the NetScaler command prompt, type:
add server FE1 10.6.6.30
add server FE2 10.6.66.31
add server edgeap1 172.29.107.101
add server edgedp1 172.29.107.103
add server edgemr1 172.29.107.104
add server edgeap2 172.29.107.105
add server edgedp2 172.29.107.109
add server edgemr2 172.29.107.110
save config
Add Load Balancing Service Groups:
This is where the Load Balancing algorithm and policies are defined.
In the NetScaler GUI, navigate to Load Balancing -&gt; Service Groups -&gt; Add.

<table>
<thead>
<tr>
<th>Service Group</th>
<th>Protocol</th>
<th>Lync Server</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>svc_LYNC5060</td>
<td>TCP</td>
<td>FE1 FE2</td>
<td>5060</td>
</tr>
<tr>
<td>svc_LYNC5061</td>
<td>TCP</td>
<td>FE1 FE2</td>
<td>5061</td>
</tr>
<tr>
<td>svc_LYNC135</td>
<td>TCP</td>
<td>FE1 FE2</td>
<td>135</td>
</tr>
<tr>
<td>svc_LYNC444</td>
<td>TCP</td>
<td>FE1 FE2</td>
<td>444</td>
</tr>
<tr>
<td>svc_LYNC443</td>
<td>SSL_BRIDGE</td>
<td>FE1 FE2</td>
<td>443</td>
</tr>
<tr>
<td>svc_LYNC80</td>
<td>TCP</td>
<td>FE1 FE2</td>
<td>80</td>
</tr>
<tr>
<td>svc_LYNCedgeap</td>
<td>SSL_BRIDGE</td>
<td>edgeap1 edgeap2</td>
<td>443</td>
</tr>
<tr>
<td>svc_LYNCedgedp</td>
<td>SSL_BRIDGE</td>
<td>edgedp1 edgedp2</td>
<td>443</td>
</tr>
<tr>
<td>svc_LYNCedgemr</td>
<td>SSL_BRIDGE</td>
<td>edgemr1 edgemr2</td>
<td>443</td>
</tr>
<tr>
<td>svc_LYNCedgeap1135</td>
<td>TCP</td>
<td>edgeap1 edgeap2</td>
<td>135</td>
</tr>
</tbody>
</table>
Service Groups:
When finished entering Service Groups, your configuration should match the screenshot and the values in the table.

Using the Command Line Interface:
At the NetScaler command prompt, type:
add serviceGroup svc_LYNC5060 TCP
add serviceGroup svc_LYNC5061 TCP
add serviceGroup svc_LYNC135 TCP
add serviceGroup svc_LYNC444 TCP
add serviceGroup svc_LYNC443 SSL_BRIDGE
add serviceGroup svc_LYNC80 TCP
add serviceGroup svc_LYNChgeap SSL_BRIDGE
add serviceGroup svc_LYNChgedep SSL_BRIDGE
add serviceGroup svc_LYNChgedemr SSL_BRIDGE
add serviceGroup svc_LYNChgedeap135 TCP
bind serviceGroup svc_LYNC5060 FE1 5060
bind serviceGroup svc_LYNC5060 FE2 5060
bind serviceGroup svc_LYNC5061 FE1 5061
bind serviceGroup svc_LYNC5061 FE2 5061
bind serviceGroup svc_LYNC135 FE1 135
bind serviceGroup svc_LYNC135 FE2 135
bind serviceGroup svc_LYNC444 FE1 444
bind serviceGroup svc_LYNC444 FE2 444
bind serviceGroup svc_LYNC443 FE1 443
Bind Monitors to Service Groups:
In the NetScaler GUI, navigate to Load Balancing -> Service Groups -> Open ->. Select the Monitors tab, and assign the server monitor.

Bind Availability Monitors

```plaintext
bind serviceGroup svc_LYNC443 FE2 443
bind serviceGroup svc_LYNC80 FE1 80
bind serviceGroup svc_LYNC80 FE2 80
bind serviceGroup svc_LYNCedgeap edgeap1 443
bind serviceGroup svc_LYNCedgeap edgeap2 443
bind serviceGroup svc_LYNCedgedp edgedp1 443
bind serviceGroup svc_LYNCedgedp edgedp2 443
bind serviceGroup svc_LYNCedgemr edgemr1 443
bind serviceGroup svc_LYNCedgemr edgemr2 443
bind serviceGroup svc_LYNCedgeap135 edgeap1 135
bind serviceGroup svc_LYNCedgeap135 edgeap2 135
save config
```
Bind Monitors:
These are the Monitors that will poll the Microsoft Lync servers to determine if they are up and running - for high availability.

<table>
<thead>
<tr>
<th>Service Group</th>
<th>Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>svc_LYNCS05060</td>
<td>MON_5060</td>
</tr>
<tr>
<td>svc_LYNCS05061</td>
<td>MON_5061</td>
</tr>
<tr>
<td>svc_LYNCS135</td>
<td>MON_5061</td>
</tr>
<tr>
<td>svc_LYNCS444</td>
<td>MON_5061</td>
</tr>
<tr>
<td>svc_LYNCS443</td>
<td>MON_443</td>
</tr>
<tr>
<td>svc_LYNCS80</td>
<td>MON_80</td>
</tr>
<tr>
<td>svc_LYNCSedgeap</td>
<td>MON_443</td>
</tr>
<tr>
<td>svc_LYNCSedgeap</td>
<td>MON_443</td>
</tr>
<tr>
<td>svc_LYNCSgedmr</td>
<td>MON_443</td>
</tr>
<tr>
<td>svc_LYNCSedgeap</td>
<td>MON_5061</td>
</tr>
</tbody>
</table>

Using the Command Line Interface:
At the NetScaler command prompt, type:
bind lb monitor MON_5060 svc_LYNCS05060
bind lb monitor MON_5061 svc_LYNCS05061
bind lb monitor MON_5061 svc_LYNCS135
bind lb monitor MON_5061 svc_LYNCS443
bind lb monitor MON_80 svc_LYNCS80
bind lb monitor MON_443 svc_LYNCSedgeap
bind lb monitor MON_443 svc_LYNCSedgeap
bind lb monitor MON_443 svc_LYNCSedgeap
bind lb monitor MON_443 svc_LYNCSedgeap135
Add Load Balancing Virtual Servers:

These are the Virtual Servers that end-users will connect to. These IP Addresses should be resolvable by DNS.

In the NetScaler GUI, navigate to Load Balancing -> Virtual Servers -> Add.

Enter each virtual server name and VIP - Virtual IP Address, protocol and port number.

On the advanced tab, enter 1200 seconds for the Client-Timeout. This value should be at least the same or equal timeout value set in Microsoft Lync.
Virtual Servers:
When finished the Virtual Servers should match the screenshot and table below.

<table>
<thead>
<tr>
<th>Virtual Server</th>
<th>IP Address</th>
<th>Protocol</th>
<th>Port</th>
<th>Service Group</th>
<th>Persistence</th>
<th>Client Timeout</th>
</tr>
</thead>
<tbody>
<tr>
<td>vsrv_LYNC135</td>
<td>10.6.66.35</td>
<td>TCP</td>
<td>135</td>
<td>svc_LYNC135</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNC444</td>
<td>10.6.66.35</td>
<td>TCP</td>
<td>444</td>
<td>svc_LYNC444</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNC5060</td>
<td>10.6.66.35</td>
<td>TCP</td>
<td>5060</td>
<td>svc_LYNC5060</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNC5061</td>
<td>10.6.66.35</td>
<td>TCP</td>
<td>5061</td>
<td>svc_LYNC5061</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNC443</td>
<td>10.6.66.35</td>
<td>SSL_BRIDGE</td>
<td>443</td>
<td>svc_LYNC443</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNC80</td>
<td>10.6.66.35</td>
<td>TCP</td>
<td>80</td>
<td>svc_LYNC80</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNCedgeap</td>
<td>172.29.107.214</td>
<td>SSL_BRIDGE</td>
<td>443</td>
<td>svc_LYNCedgeap</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNCedgedp</td>
<td>172.29.107.217</td>
<td>SSL_BRIDGE</td>
<td>443</td>
<td>svc_LYNCedgedp</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNCedgemr</td>
<td>172.29.107.218</td>
<td>SSL_BRIDGE</td>
<td>443</td>
<td>svc_LYNCedgemr</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
<tr>
<td>vsrv_LYNCedge135</td>
<td>172.29.107.214</td>
<td>TCP</td>
<td>135</td>
<td>svc_LYNCedge135</td>
<td>Source IP -or-Cookie Insert</td>
<td>1200 secs</td>
</tr>
</tbody>
</table>
Using the Command Line Interface:

At the NetScaler command prompt, type:

```
add lb vserver vsrv_LYNC135 TCP 10.6.66.35 135 -persistenceType SOURCEIP -cltTimeout 1200
add lb vserver vsrv_LYNC444 TCP 10.6.66.35 444 -persistenceType SOURCEIP -cltTimeout 1200
add lb vserver vsrv_LYNC5060 TCP 10.6.66.35 5060 -persistenceType SOURCEIP -cltTimeout 1200
add lb vserver vsrv_LYNC5061 TCP 10.6.66.35 5061 -persistenceType SOURCEIP -timeout 22 -cltTimeout 1200
add lb vserver vsrv_LYNC443 SSL_BRIDGE 10.6.66.35 443 -persistenceType SOURCEIP -cltTimeout 1200
add lb vserver vsrv_LYNC80 TCP 10.6.66.35 80 -persistenceType NONE -state DISABLED -cltTimeout 9000
add lb vserver vsrv_LYNCedgeap SSL_BRIDGE 172.29.107.214 443 -persistenceType SOURCEIP -cltTimeout 1200
add lb vserver vsrv_LYNCedgedp SSL_BRIDGE 172.29.107.217 443 -persistenceType SOURCEIP -cltTimeout 1200
add lb vserver vsrv_LYNCedgemr SSL_BRIDGE 172.29.107.218 443 -persistenceType SOURCEIP -cltTimeout 1200
add lb vserver vsrv_LYNCedgeap135 TCP 172.29.107.214 135 -persistenceType SOURCEIP -cltTimeout 1200
bind lb vserver vsrv_LYNC5060 svc_LYNC5060
bind lb vserver vsrv_LYNC5061 svc_LYNC5061
bind lb vserver vsrv_LYNC135 svc_LYNC135
bind lb vserver vsrv_LYNC444 svc_LYNC444
bind lb vserver vsrv_LYNC443 svc_LYNC443
bind lb vserver vsrv_LYNC80 svc_LYNC80
bind lb vserver vsrv_LYNCedge-ap-443 svc_LYNCedgeap
bind lb vserver vsrv_LYNCedge-dp-443 svc_LYNCedgedp
bind lb vserver vsrv_LYNCedge-mr-443 svc_LYNCedgemr
bind lb vserver vsrv_LYNCedge-ap-135 svc_LYNCedgeap135
```
About Citrix

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